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ABSTRACT

The report presents results of the first year's effort in developing a master plan for higher education in Texas. The first section highlights contributions of Texas higher education in the areas of research, public service, and teaching. Examined in the next section is the current higher education setting with data on the present status of Texas higher eduction, Texas demography, and the Texas economy. The third section identifies problems challenging Texas higher education including a 16% adult illiteracy rate, crime, and the changing economy. The final section presents six principles and related goals. The principles include making higher education accessible to all those who seek and qualify for admission and making support through adequate funding a critical issue. Some of the goals are to: develop a centralized statewide telecommunications system to provide access in regions throughout the state; maximize the use of local funds to include federal, corporate, and philanthropic funds; and develop and implement a uniform financial reporting system. Four appendices provide: a planning schedule; history and description of Texas higher education; Texas population figures; and the annual status report for fiscal year 1988. (SM)

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HE 023 186

Long-Range Planning for Texas Higher Education

January 1989

Texas Higher Education
Coordinating Board

We believe that higher education is vital to human advancement and that support for higher education reveals a society's commitment to progress. An investment in education is an investment in this State's future development and prosperity. By exploring the frontiers of knowledge, higher education produces new ideas to meet future challenges.

Recognizing that economic, technological and social changes will increase at exponential rates, the State's continued economic expansion and productivity will require current and future generations of Texans not only to be trained for vocations and professions, but also to be educated to understand the cultural, scientific and social environment in which they will live, work and compete. Thus, the public higher education system of Texas should provide an educational environment conducive to collective excellence and individual achievement.

Whereas Texas traditionally prospered through the hard work of its citizens and the development of bountiful natural resources, the State's future prosperity will depend more extensively upon economic diversification and the cultivation of its human resources through education. Therefore, we affirm the necessity and importance of all aspects of higher education -- vocational and technical training, liberal arts and sciences education, graduate and professional education and training -- believing that only all in concert are sufficient to provide the broad educational opportunities the future will demand.

This Charter sets out the principles and provisions by which the future development of higher education in Texas shall be guided.

Preamble, Texas Charter for Public Higher Education
Adopted by the 70th Texas Legislature, Regular Session 1987
As proposed by the Select Committee on Higher Education

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Introduction

This report is the culmination of the first year's effort in developing a master plan for higher education in Texas. The document highlights the accomplishments of higher education, describes its current status, and presents the challenge that is central to the higher education enterprise today. It includes a summary of the goals from a working draft developed by the Coordinating Board and reviewed by the institutions in fall 1988. A status report for fiscal year 1988 is also included. (The status report will replace the annual report that the Coordinating Board previously produced as a separate publication.)

The working draft is an extension of the *Texas Charter for Public Higher Education*, developed by the Select Committee on Higher Education and adopted by the 70th Legislature in 1987. The Charter's six principles, based on concepts of access, quality, diversity, funding, management, and leadership, will provide the framework for the master plan, the development of which was mandated by the same Legislature that adopted the Charter. A final plan will be developed by an advisory committee, appointed by the Commissioner of Higher Education, working in cooperation with Coordinating Board staff.

The examples cited throughout this report from selected institutions are not intended to favor some colleges or universities while slighting others. Successes and progress are meaningless without specific examples, but not all good examples can be cited even in a long document, and the intent here is to keep this report short. This report could be presented again without any change except to cite other examples available from Texas higher education, and it would be every bit as convincing and effective.

The Contributions of Texas Higher Education

The contributions of higher education, commonly divided into categories of research, public service, and teaching, lie at the heart of a prosperous, healthy, and humane society. The only social organization in which knowledge is the exclusive commodity, the institutions of higher learning, flanked by all the components of the higher education enterprise and supported by government and industry, also stands as perhaps the single most influential factor in ensuring success in the state's new knowledge-based economy. Through research, knowledge is produced; through public service, knowledge is applied for the betterment of society; and through teaching -- which is the prime mission of higher education -- knowledge is distributed.

Accomplishments in Research

Research activity and accomplishments provide a visible measure of the state's progress in building the new economy, and the research enterprise associated with Texas institutions of higher education is large and growing. University research programs pumped $610 million into the state's economy in 1987, creating an estimated 28,670 new jobs and producing an overall economic impact of $1.4 billion. Scientists, managers, engineers, and entrepreneurs running hundreds of research programs at institutions of higher learning from the Valley to the plains are producing new technologies and products capable of touching virtually every dimension of our lives.

The production of food and agricultural products remains a major area of university research. As a result of investigations, for example, at the Texas Agricultural Experiment Station, a component of the Texas A&M University System, a new brucellosis vaccine for cattle may save millions of dollars annually in production losses and herd quarantines. The Experiment Station has also developed ways to boost commercial shrimp production, enabling Texas producers to capture a significant share of the nation's shrimp market and to improve the production of rice, such that even in the face of strong international competition, Texas has been able to maintain and expand its market position in rice production and sales. At Texas A&I University, researchers have developed the super red "Rio Red" grapefruit, the pride of the Texas citrus industry. And studies are underway at Sul Ross State University and several other institutions to improve the production and quality of native grapes to strengthen the state's burgeoning wine industry.

While Texas is expanding its economy beyond the agriculture and oil and gas industries, the new technologies, particularly in biology and computer science, are already playing significant roles in helping Texas agriculture maintain its competitive stance in national and international markets.

From the development at Texas A&M of the new 1015Y Super Sweet onion to the discovery at the University of Texas Southwestern Medical Center at Dallas of genetic switches controlling cholesterol synthesis, university researchers are making the advances in technology and product development that will drive the knowledge-based economy of the future, contributing at the same time to the welfare of the people of Texas as well as the nation and others around the world. A pharmaceutical company, for instance, used the cholesterol work by Southwestern's Nobel prize-winners, Michael Brown and Joseph Goldstein, to produce a new drug, Mevacor, now used by several hundred thousand Americans to prevent and treat heart disease.

The Texas Legislature encouraged such collaborations between industry and university when in 1987 it passed the Texas Intellectual Property Law. The law encourages the state's public institutions of higher education to develop policies to commercialize their inventions. Changes in the last decade in federal law have also fostered the trend in "technology transfer."

Bringing the results of university research into the marketplace benefits the researcher, spurs additional research efforts at the university, and spawns new businesses and technologies. The commercialization of University of Houston physicist Paul Chu's work on superconductivity is one example. His research opens the way for major advances in the production and use of electricity and is expected to lead to much more efficient technology in transportation, medical equipment, oil exploration, and computers.

Another example of technology transfer is the development of instrumentation for cancer treatment at the Texas A&M Cyclotron Institute -- the only such facility in Texas, one of only three at universities in the U.S., and a more powerful one than any comparable Department of Energy facility. Research at the Cyclotron Institute has opened up an entirely new realm of nuclear and atomic physics.

The development of leading edge technology draws national and international recognition to Texas at the same time that it stimulates employment, expands the state's economic foundation, and benefits such service industries as banking, law, telecommunications,and computing. One area in which university researchers

FEDERAL RESEARCH DOLLARS 1986

(Rounded to Nearest Million)

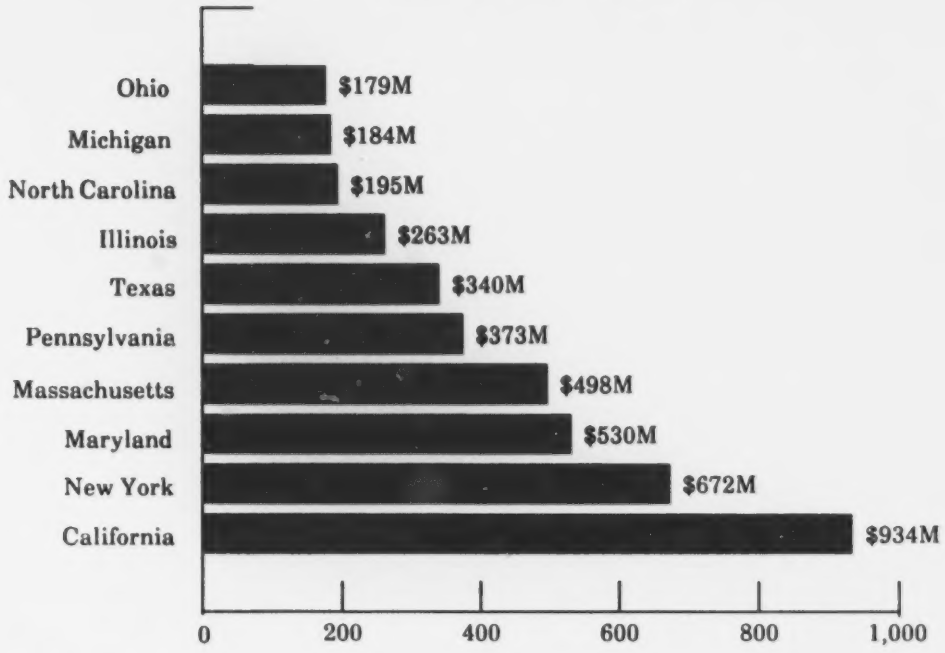

Figure 1

are rapidly generating new knowledge is biomedical technology. Activity is increasing in three cities, including Dallas, where private gifts and grants at UT Southwestern Medical Center have increased from over $14 million in 1987-88 to over $50 million in fall 1988; Houston, where Texas A&M is building a $44 million facility at the Texas Medical Center that will tie together biotechnology, biogenics, nutrition, and comparative veterinary medicine with medical research, probably the first such effort in the country; and San Antonio, where biotechnological research at the Texas Research Park, now being constructed, is expected to add an entirely new dimension to the city's economic base.

In 1987, to increase technological development in Texas, the Legislature established two competitive grants programs in science and engineering for university research, the Advanced Technology Program and the Advanced Research Program. Administered by the Coordinating Board, they were funded with a $60 million appropriation for the biennium, the largest single amount ever appropriated by a state for that purpose. The 345 projects supported through those funds range from the development of nutritionally balanced food bars by Texas Woman's University and the Texas A&M Engineering Experiment Station to the testing, by Michael DeBakey at Baylor College of Medicine, of a temporary heart replacement system -- the marketing of which is estimated to be in the range of $100 million.

Other projects supported through these grants include the construction of a lightweight robot tentacle, the development of technologies to clean up groundwater contaminated by hazardous waste sites, the use of computing systems to diagnose learning disabilities, and the development of a new treatment for AIDS.

The state's investment in university research attracts private and federal funds. Texas is ranked sixth among the 50 states in the total federal research and development monies it receives.

The universities and medical centers within the University of Texas System, which serves as a base for numerous research centers including the Bureau of Business Research, the Population Research Center, the High Performance Computing Center, and the Bureau of Engineering Research to name only a few, attract the majority of federal and private research funds. In 1987, $388.4 million in external funds flowed through the University of Texas System and into the

state's economy, producing an estimated impact of over $900 million and 18,250 jobs.

As a university system with extensive research activities, the University of Texas System, with which at the national level only the University of California and the State University of New York are of comparable strength, has played a key role in attracting to Texas the computer research consortia, Sematech and MCC (Microelectronics and Computer Technology Corporation). Similarly, the new Center for Research on Parallel Computation at Rice University was funded with $22.9 million from the National Science Foundation. It is expected to have the same kind of potential for boosting Houston's economy as MCC had in Austin. The center will work to make the world's fastest supercomputers even faster.

Equally impressive is Texas A&M University's recent move into the National Science Foundation's list of the nation's top 10 research universities. This 1988 list, based on research expenditures, shows the university spent almost $220 million on 2,100 funded research projects. No single university in the South or Southwest has had more success in acquiring research funding.

The collaborative approach of multiple organizations, including Texas A&M, The University of Texas, University of Houston, and others in "big science" endeavors (vividly exemplified in the plans for building and using the superconducting supercollider) is an emerging characteristic of the 21st Century, knowledge-based economy. The relatively recent cooperative ventures of Texas research universities with such consortia, with business and industry, with government agencies, and, increasingly, with each other hold promise of economic and educational benefits for Texans significantly greater than those achieved through independent action.

Accomplishments in Public Service

The development of products and technological processes is one important way that businesses and entrepreneurs convert the findings of higher education research into practical uses. Institutions of higher education also make available their faculty -- a community of scholars representing a vast reservoir of expertise -- for consultation with industry, local organizations, government agencies, and other bodies. In addition, institutions provide such facilities as libraries and museums plus a broad range of educational opportunities, especially training programs, that are beyond the scope of the institution's classic instructional role.

By one means or another, this reaching out to the community occurs at all levels of Texas higher education, from the community colleges to the senior institutions, professional schools, and health science centers. Institutions of higher learning provide practical assistance to society in an unlimited variety of areas, including the improvement of highways and bridges, health, environment, adult literacy, business procedures, and professional training through continuing education courses. In these and other ways, Texas higher education fulfills its obligation to provide public service.

The value to the public of the smaller, regional institutions should not be underestimated. In the freeze of 1983, for instance, the Citrus Center at Texas A&I University helped ease the otherwise catastrophic impact on the Lower Rio Grande Valley. It designed and facilitated the implementation of a unique insurance policy to protect citrus growers for trees lost from freeze damage. Adopted by the Federal Crop Insurance Corporation for Texas alone, the policy paid $18 million to Texas growers.

Public service efforts on a larger scale include the establishment at UT-Arlington of an environmental protection institute, designed to serve a five-state area. The institute will help industry devise cost-effective solutions to pollution problems and will be a boon to Texas, in particular, since it is one of the nation's largest generators of hazardous materials. And Lamar University has received $1.5 million from the Environmental Protection Agency to support the Gulf Coast Hazardous Waste Research Center.

The public will also reap the benefits of work by the newly funded transportation institute based at Texas A&M. The Department of Transportation chose Texas A&M's Texas Transportation Institute, UT Austin, and Texas Southern University to run this $10 million center which will focus on future transportation issues.

At the state's five health science centers, the public service mission is carried out in part through research programs, but largely through patient care. In 1987, health-related institutions contributed $327 million in uncompensated care, the majority of which went to uninsured and indigent patients. In addition to the health science centers, the 25 Family Practice Residency Programs provide medical services to areas of the state and to populations that would not otherwise receive care. Nursing programs as well are available in every public health region of the state.

Public health programs and community and continuing professional education programs also play vital roles. In rural West Texas, for example, a computer network, still in its experimental stages, links physicians with the resources of the Texas Tech University Health Sciences Center. Because the system

can be used to determine the level of care required and whether a patient must travel to a more sophisticated health facility for treatment, it has the potential for saving considerable time, trouble, and expense.

The UT Health Science Center at Houston provides education programs to the public-at-large as well as to the professional community, patients and students through its extensive television network. The well-known *Texas Health Report* featuring Dr. "Red" Duke is just one of the several health information programs distributed through public and commercial television stations throughout the Houston area, the nation, and the world.

A major aspect of higher education's public service mission, especially in the wake of the economic downturn of the mid-1980's, is the training and retraining of workers for the state's newly emerging businesses and technologies. Community colleges and technical institutes, offering 1,861 vocational-technical programs, play the leading role in this effort. Each year some 200,000 Texas citizens participate in their continuing education and occupational advancement programs. Tyler Junior College, for example, averted a plant closing and the layoff of 1,400 workers when it provided the sophisticated training required to convert the Kelly-Springfield Tire plant from a bias to a radial tire manufacturing facility.

To meet the demands of the state's new and highly specialized industries, an increasing number of institutions have adopted a customized approach to training, with programs specifically designed for the particular employer contracting for services. Customized training and contracted instruction stimulate local economic development and over the last decade have become commonplace in Texas community colleges and technical institutes.

In addition, community colleges and technical institutes have a leading role in providing training for aspiring proprietors of small business, the largest segment and the backbone of the Texas economy. Quick in responding to the state's need for economic development, community colleges house 16 small business development centers. The first center was established in 1986.

In an ever-changing Texas economy, the community colleges and technical institutes also provide training for tens of thousands of low-income, disadvantaged citizens and displaced workers and homemakers. The Job Training Partnership Act programs develop human capital throughout the state and contribute to local economic development by matching skills with jobs.

Other recently initiated services include assistance to local business people in finding new markets for their products through bidding on federal and military procurement projects as well as assistance in developing foreign markets.

Advising government on public policy is another dimension of the higher education public service role. Due to their objectivity and independence, universities are often asked for information and analysis of policy issues. For example, the Public Policy Resources Laboratory, established by the Legislature in 1984 at Texas A&M, has recently collected and analyzed data for a legislative study on worker's compensation, evaluated the Maternal and Infant Health Improvement Act, and carried out a statewide study of substance abuse. The University of Texas Bureau of Business Research is a similar organization. It provides an on-going analysis of the state's economy, examining such topics as employment trends in high-technology industries and changes in the maquiladora industries.

Comprehensive population and demographic data are also readily available to government officials, the business community, planners, and others through data centers affiliated with nine Texas universities. Centers at Stephen F. Austin State, Texas Tech, Pan American, and Rice, as well as Texas A&M and several University of Texas campuses, offer extensive data processing and research services.

The involvement of university scholars in the world's critical problems provides society with the kind of assistance available from practically no other quarter. The colleges and universities benefit in turn. Applying knowledge to real world problems feeds back into and nourishes the research and instructional activities within the walls of higher learning.

Accomplishments in Teaching

While research and public service are integral parts of the Texas higher education enterprise, there would be no need for a college were it not first and foremost an institution dedicated to teaching. Teaching is the primary function of higher education in two ways. It is the means for passing on the in-depth, specialized knowledge required for performance in a technological economy. More importantly, it is the means for passing on information and knowledge about humankind's place in time and in the universe and the values and ideas derived from mankind's experience on the planet, as well as the knowledge gained about the natural world in which man exists.

With the perspective that a strong undergraduate, general education provides, students are prepared to lead more meaningful lives and to become workers and leaders in business, industry, and government, and to make humane decisions. A first-class general education in the arts and sciences also develops

analytical and creative competencies, which are critical to effective performance in the dynamic, information-based business of the 21st Century.

In recent years, concerns about the quality of undergraduate education throughout the U.S. have been widespread and the subject of numerous reports from national commissions and blue-ribbon committees. The continual effort in Texas to improve undergraduate education was boosted by the Texas Legislature in 1987 when it passed a bill requiring each undergraduate institution to provide a "core" curriculum of liberal arts courses. A statewide committee is in the process of preparing guidelines, and some institutions already have such curricula in place. All are cooperating in trying to improve upon the core of general subjects to which every undergraduate should be exposed.

Dramatic progress in undergraduate education is perhaps most visible in the area of teacher preparation. More baccalaureate degrees are conferred in this field than any other, and as Texas advances into an era in which knowledge is the basic resource, state law now requires future teachers to earn degrees in academic areas.

Many Texas programs at associate, baccalaureate and graduate levels are outstanding. They cover a range of subject areas as diverse as Texas itself, and are far too numerous to describe here.

The quality of instruction in outstanding programs is a direct reflection of the quality of faculty. Texas institutions of higher education claim some of the most distinguished and creative scientists, researchers, thinkers, writers, and entrepreneurs in the country, including eight Nobel laureates. All across the state, the number of endowed faculty positions has grown significantly in recent years.

High caliber faculty attract external funds for research programs and top level students, particularly at the graduate level. Texas public and private universities recruit an impressive group of undergraduates as well, including 700 Merit Scholars.

Overall, the 1980s have brought marked changes in the composition and sheer size of the college student population in Texas. The numbers of people enrolling in Texas public junior and senior colleges and universities have increased steadily through the 1970s and, for the most part, have continued to increase to the present. With the dramatic 5.8 percent enrollment increase in fall of 1988 added to the growth in fall of 1987, enrollment grew by almost 70,000 students, the equivalent of adding another University of Texas at Austin and Texas Tech to the higher education system in just two years. Texas institutions of higher education are serving a record 834,444 students in 1988-89.

It is a new phenomenon that many of today's college students are older, with students in a number of our institutions averaging about age 30. Some are minorities, and some are displaced workers seeking retraining at a community college. Others are high school graduates who in years past would not have pursued a college degree but in today's economy have difficulty finding a job without one. This difficulty will become more prevalent as Texas reaches the turn of the century, by which time almost one-third of all new jobs will be filled by college graduates.

The increasing diversity in the college student body, and especially the growing numbers of students underprepared for college-level work, present faculty with new challenges in teaching. In 1987, Texas high school graduates who took the Scholastic Aptitude Test averaged only 875 compared to the 904 national average. It has been estimated that approximately a third of the freshmen entering Texas public colleges do not have sufficient academic skills to do college-level work.

In cooperation with the Coordinating Board, the Texas Education Agency, a national testing company, and other experts, the higher education community has worked over the past two years to develop the Texas Academic Skills Program, designed to help students perform better in college-level coursework and to keep students in college. The comprehensive program includes a testing component with advisement and remedial components for those students who need improvement in reading, writing, and mathematics skills. The benefits of this important program will be far reaching. Ultimately, the economic and social well-being of Texas will be improved by graduates who are better qualified to participate in a rapidly changing society.

Another way to serve higher education's expanded, varied, and widely dispersed student population is through a statewide telecommunications system. Such a network could make available the highest caliber of instructional resources to all areas of the state. For example, instruction now offered at several outstanding Texas engineering schools could be shared among institutions and, through satellite or fiber optics technology, made available in places where engineering education has never been offered. Existing regional networks, offering courses ranging from engineering to education, are already operating in the Gulf Coast area, North Texas, and the Panhandle. Planning is underway at the Coordinating Board for a statewide system, as called for by the 70th Legislature.

The Higher Education Setting

Viewed as a whole, the achievements in research, public service, and teaching of the Texas system of higher education are surpassed in breadth or depth by few other states. The success and quality of the enterprise is grounded in a history of growth and change as political, business and educational leaders have sought ways to provide educational opportunity throughout the vast state.

Status of Texas Higher Education

Currently, Texas institutions of public higher education employ more than 40,000 faculty and 30,700 support staff, and serve more than 834,000 students. Comprised of 96 institutions and numerous state agencies and service entities, the higher education enterprise in Texas has an annual operating outlay of approximately $4.4 billion and capital assets valued at nearly $7 billion. The public system is complemented by an extensive network of independent colleges and universities.

There are 37 public general academic institutions, 37 independent institutions, seven public medical schools and one independent medical school. In combination, these institutions offer programs in a wide variety of fields and types of degrees. (See Table 1.)

The public universities and centers are located throughout the state, with all metropolitan areas being served. More than 150 of Texas' 254 counties have a public senior institution within their boundaries or in a contiguous county. One-half of the approximately 100 counties which are not in proximity to a public university or center are located in more sparsely populated areas of the state. The health-related units are concentrated in the population centers: Houston-Galveston, Dallas-Fort Worth, San Antonio, and Lubbock. Public community colleges and the technical institute campuses are located throughout the state. All urban areas and most of the rural areas have a campus nearby, except for a few counties in east, west-central, and north-central Texas. About 190 counties (75 percent) either have a campus within its boundaries or in a contiguous county. Including out-of-district locations, community colleges taught courses in more than 200 counties in 1988-89.

The independent institutions are concentrated in the central and northern parts of the state. However, there are three independent universities and a college of medicine in Houston, seven institutions in East Texas, and two in the Panhandle.

See Appendix B for a more detailed description of Texas Higher Education.

Texas Demography

Foremost among the many factors that will affect enrollments in institutions of higher education is the demographic structure. Age and ethnic composition are likely to have greatest significance for change in higher education in the decades ahead. From 1985 to 1995 the older age groups in Texas will increase at a much faster rate than the population as a whole. The youngest age group (0-14) will grow at a rate slightly greater than the population as a whole and maintain about the same relative ratio (24 percent) in 1995 as in 1985. On the other hand, four age groups (15-19, 20-24, 25-29 and

Type of Degree Programs Offered	Senior Colleges and Universities		
	Public	Independent	Public Medical
Multiple Doctorate	8	5	7
Single Doctorate	6	---	---
Baccalaureate and Master's	9	15	---
Upper Level and Master's	10	---	---
Baccalaureate	1	18	---
Four-Year Special	1	---	---
Lower Level	2	---	---

Table 1

1986 SENIOR COLLEGE RESIDENT ENROLLMENT BY ETHNICITY AND AGE

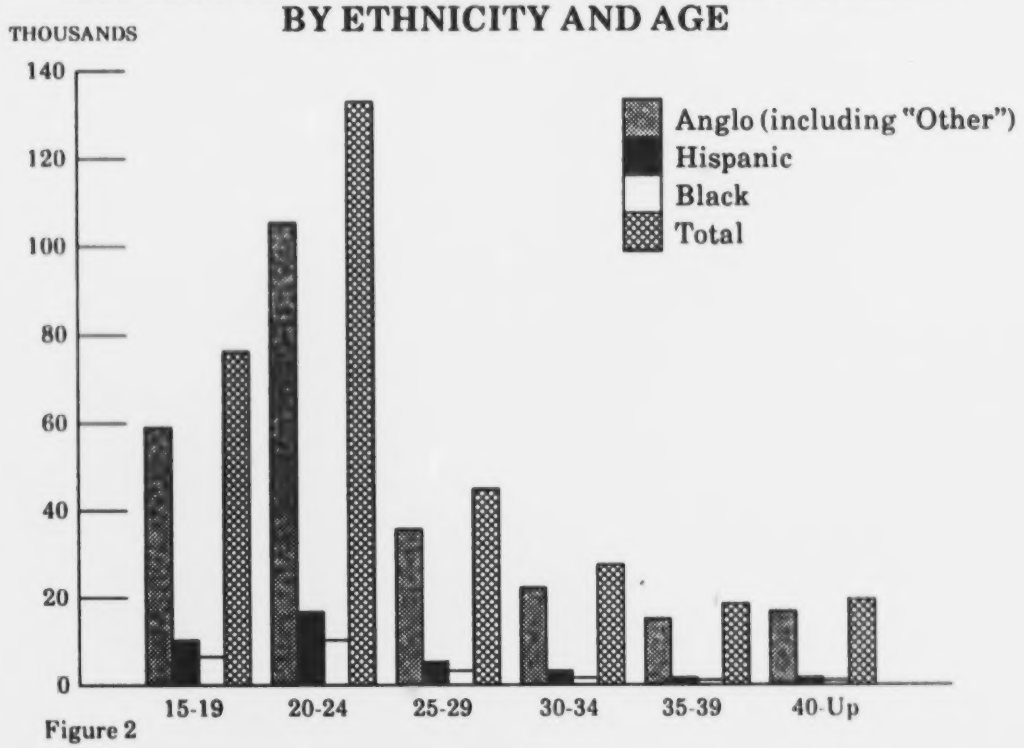

Figure 2

1986 COMMUNITY COLLEGE RESIDENT ENROLLMENT BY ETHNICITY AND AGE

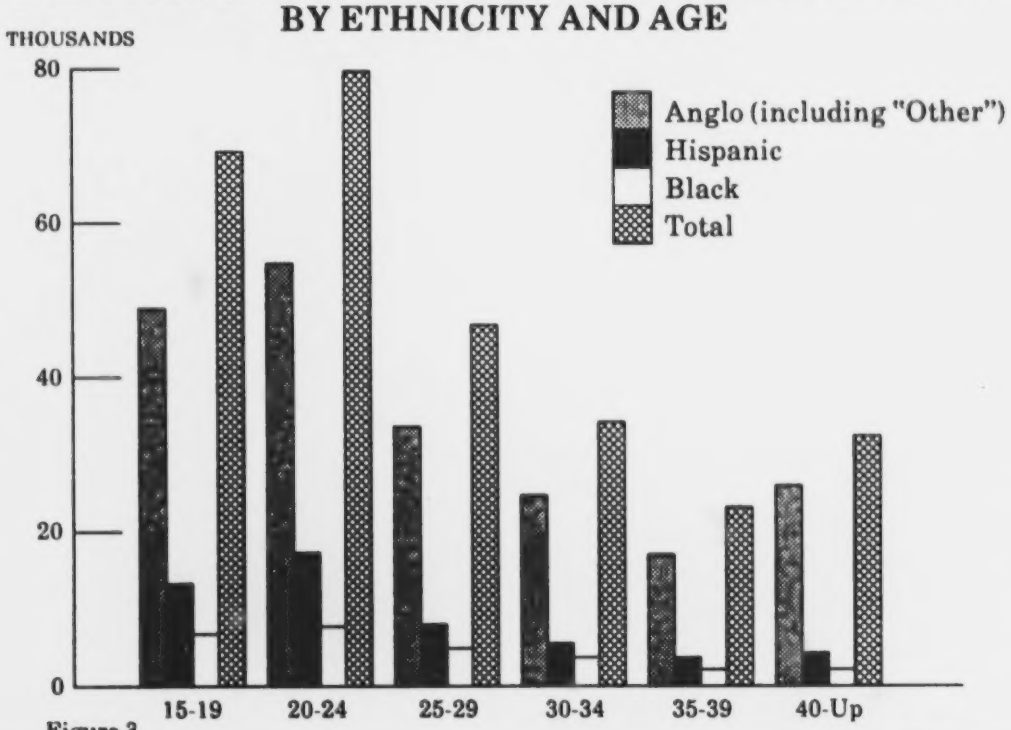

Figure 3

30-34) will constitute a smaller portion of the population in 1995.

In relation to the Anglo and black groups, the Hispanic population will comprise a significantly greater proportion of the population in 1995 than in 1985. During this 10-year period the number of Hispanic people of all ages will about double the growth rate for the population as a whole. A more dramatic change is indicated for the Hispanic population in the 15-34 year age group. (See Appendix C for additional data regarding the Texas Population.)

Age and ethnic data for students at public universities and public community colleges in 1986 are shown in Figures 2 and 3. The data show that Anglo students account for about 80 percent of the public university enrollment and about 72 percent of the community college enrollment. The majority of these Anglo students (69 percent) are less than 35 years old. A loss is expected in the Anglo population for ages 15-34 between 1985 and 1995. At the same time, the minority population (especially Hispanics) in this age group will be increasing. But, the public university participation rates for Hispanics and blacks fall far short of those for Anglo students. In 1986 the statewide public university enrollment rates for all age groups (students of a selected age group divided by the population for that age group) were at least 100 percent higher for Anglo students compared to Hispanics. The participation rates for blacks were slightly better than for Hispanics but still from 70 to 100 percent lower compared to Anglo students depending upon the age group. Minority enrollment in community colleges is somewhat higher than in the public universities, making up approximately 30 percent of the total enrollment. Nevertheless, from an enrollment rate standpoint, Hispanic and black students still lag behind Anglos by 20 to 60 percent depending upon the age group.

In summary, current enrollment in Texas public colleges and universities is, to a great degree, dependent upon Anglo students between the ages of 15 and 34. During the next several years the demographics of the Texas population indicate a decline in this particular ethnic/age category. However, the Hispanic population ages 15-34 will increase dramatically and the black population will increase slightly. Increases in these populations will not have a major effect on enrollments, however, unless participation rates for these ethnic groups are improved. And while increasing participation of minorities in higher education is essential, the prerequisite requirement for making this possible is to raise the percentage of minorities completing high school. The participation rates for all groups, but particularly minorities, must be improved if Texas is to have the workforce necessary to further diversify the economy.

The Texas Economy

In the 1970s and early 1980s Texas experienced phenomenal growth and economic good fortune. During a 10-year period, the population increased by 27 percent, the unemployment rate averaged about 4.2 percent, the gross state product increased at a higher percentage rate than did the gross national product, and per capita income surpassed the national average. Then, in 1982, Texas experienced an economic downturn due to lower oil and gas prices. A second, more severe and wider spread economic crisis came in 1986, affecting the mining, manufacturing, construction, and financial sectors.

After two years of widespread recession, economists generally agree that the Texas economy has bottomed out and in the last two quarters of 1988 is on the way to recovery.[1] Forecasts are cautiously optimistic, calling for growth in jobs, personal income, and gross state product ahead of national trends in the 1990s. While these economic gains are for the most part broad based, with the recovery being led by the manufacturing, services, and trade industries, performance in some sectors is still sluggish. Growth in construction, finance, insurance, and real estate has lagged.

The oil and gas industry is still Texas' number one industry, but as the state's economy has diversified, the relative importance of oil and gas has declined from 27 percent of total state economic output in 1981 to 15 percent in 1988. The industry is now stable but shows no signs of rejuvenation.

The Strategic Economic Policy Commission, created by the 70th Texas Legislature, contends that the future strength of the Texas economy depends on two factors: business and industry's competitiveness in the international market and the adaptation of technology to manufacturing, products, and services. The Texas higher education system is expected to play a major role in building and sustaining a strong economy, in which, by the year 2000, three out of four jobs will require training beyond the high school level. Colleges and universities will need to train and retrain professionals, scientists, and technicians in response to national and local needs. There must be a strong commitment to university research as well. For Texas to remain competitive on a technological basis, the higher education system must receive sufficient funding to produce the highest quality graduates.

[1]This conclusion and the statistical data in this section are based on publications by the following sources: Baylor University Forecasting Service; The Strategic Economic Policy Commision; Economic Analysis Center, Texas Comptroller of Public Accounts; and Bureau of Busines Research, The University of Texas at Austin.

The Challenge

The connection between higher education, the quality of the workforce, and the health of the economy has never been more clear. An excellent faculty plus modern research facilities and a variety of information services -- such as libraries -- enhance quality of life at the same time that they create skilled and adaptable labor, advance the development of technology, and generate research programs and federal funds, all of which attract new industry and spawn entrepreneurial activity.

A recent report that rates the economic climate of each of the states focuses repeatedly on educational measures as an indication of a state's economic health. *Making the Grade: The 1988 Development Report Card for the States* by the Corporation for Enterprise Development points out that, as the economy has changed, so have the conditions important to economic development: "The old economy was driven by quantity; the new economy is driven by quality. The old economy was fueled by brawn; the new economy is fueled by brains. The old economy was concerned with cost; the new economy is concerned with value." In accordance with this line of reasoning, it was determined that a new way to measure state economies was needed. Among the indicators included in the Development Report Card are, to name just a few, level of college attainment, number of science doctoral students, number of engineers in the workforce, pupil teacher ratio, availability of remedial education, and university research and development dollars per capita.

The educational infrastructure of a state is clearly deemed critical to the development of new business. Recent evaluations of Texas have been favorable. The list is long of companies that cite the quality of the state's educational system as the reason for locating in Texas. They include not only MCC and Sematech, but 3M, Westinghouse, Vista Chemical, Enercraft Inc., Phyto Resources, Grumman, a manufacturer of space-related projects, International Resistive Company, Hoover, Yazaki, an auto parts manufacturer, and Fujitsu, the U.S. subsidiary of Japan's largest computer company.

This is all on the positive side, and as Texas looks to the 21st Century and beyond, the system of higher education stands ready to take a leading role in preparing a qualified workforce. But at this critical point, when Texas is depending on massive infusions of educated workers, there is a negative side which must be addressed.

The pool from which to draw our "high tech" workforce is growing smaller. The black and Hispanic minority populations, which are expanding rapidly, are proportionately society's most under-educated citizens. Expected to comprise almost half the college-aged population in just 15 years, minorities in large numbers have not been prepared in high school to take advantage of college or university instruction. Nearly half of the Hispanic students entering high school do not finish. And with 34 percent of blacks dropping out after the eighth grade, Texas has one of the worst dropout rates in the country for these minority groups.

In addition, 16 percent of all adults in Texas cannot read at a fourth grade level; only three other states have adult illiteracy rates as high. And poverty levels, as measured by Aid to Families with Dependent Children benefits, are higher in Texas than almost all other states. The rate of serious crime, according to FBI figures, is -- next to Florida--the worst in the nation. Texas is ripe for the development of a "permanent underclass" unless major new initiatives are undertaken quickly.

The state has no alternative but to find the means by which access to higher education may be increased -- and, it should be emphasized, access to <u>quality</u> education. Access can be increased without threatening quality, but to produce real results will require real growth in funding. New appropriations are required for the extensive remediation programs that the Legislature mandated in the Texas Academic Skills Program and for the minority recruitment and retention programs recommended in the proposed state educational opportunity plan. Crucial to the success of any program to increase minority participation in higher education is the availability of financial aid. Scholarship programs are particularly important since disadvantaged youth may lower their educational aspirations rather than assume a large loan debt. Yet while Texas ranks third in the nation in total appropriations for higher education, it ranks 12th in the amount of need-based assistance it provides.

The key to quality instruction is quality faculty. The 70th Legislature is to be commended for having raised faculty salaries, but the increases were not enough to equal the average of the 10 states nearest Texas in population. To attract and retain faculty, Texas senior colleges <u>must</u> be able to offer salaries at the average level of universities in the 10 largest states. It is with these states that Texas competes for faculty, research grants, and industry. The level of faculty salaries has never been so crucial as now, when universities are actively bidding for star professors.

Supporting competitive faculty salaries is

essential, but not enough. Resources in several other critical areas have actually decreased since 1985. For instance, funding has been reduced for libraries, a reflection of an institution's academic excellence, by $17 million in 1989 while the cost of journals and magazines has escalated greatly. Additionally, 1989 appropriations for general administration dropped $18 million and appropriations for custodial services dropped $9 million.

Even maintaining current funding would translate into fewer resources per student as enrollments continue to grow and the institutions implement critical new programs, such as remediation, mandated by the Legislature. This will further dilute monies available to existing programs. Closing schools or programs is not a politically viable option.

This report has been an attempt to describe at this point in long-range planning, where Texas stands in terms of accomplishments, problems, hopes, and resources. To respond to the needs of a changing economy, Texas must work to enhance the quality of its educational system, and to increase its accessibility, such that all individuals and society, as a whole, benefit. In the proper perspective, it becomes clear that education is not a taxpayer cost, but an investment in a stable, productive, and peaceful future.

The Principles and Proposed Goals

The five-year Master Plan for Higher Education is to be based on six principles developed and published in the *Texas Charter for Public Higher Education* and adopted by the 70th Legislature in 1987. These principles concern access, quality, diversity, funding, management, and leadership. The following paragraphs list these principles and summarize a set of proposed goals for each area. These goals are subject to modification as the planning process progresses; additional goals may be adopted or some of the proposed goals deleted.

PRINCIPLE -- ACCESS: HIGHER EDUCATION SHOULD BE ACCESSIBLE TO ALL THOSE WHO SEEK AND QUALIFY FOR ADMISSION.

"Neither financial nor social status should serve as a barrier to opportunities for higher education in Texas. Financial aid as well as academic and social support services should be available. Texas colleges and universities shall actively recruit and retain students from populations that have not heretofore fully participated in higher education."
Principle II, *Texas Charter for Public Higher Education*

GOAL: ENABLE ALL THE PEOPLE OF TEXAS TO PARTICIPATE IN HIGHER EDUCATION AT THEIR HIGHEST ACHIEVABLE LEVEL, REGARDLESS OF THEIR ETHNICITY, OR INCOME.

The inclusion of all Texas citizens in a quality higher education is both an economic necessity and a moral imperative. The state and its institutions of higher education must pursue positive action through systematic adjustments in minority recruitment, enrollment, retention, and academic programs to achieve parity.

GOAL: ENSURE THAT FINANCIAL STATUS SHALL NOT BE A BARRIER TO PARTICIPATION IN HIGHER EDUCATION BY PROVIDING FINANCIAL ASSISTANCE IN SUFFICIENT QUANTITY AND THROUGH APPROPRIATE EFFECTIVELY ADMINISTERED PROGRAMS.

Funding for the major federal and state financial aid programs has more than doubled since 1983. This growth, however, has not been consistent across the three types of financial aid programs (grants, work, and loans). While aid increased by 94 percent, loan aid increased by over 163 percent. And the proportion of available aid that is loans increased from about 41 percent in 1983 to 50 percent in 1987. In contrast, the proportion of available aid that was grants decreased over the same time period, from 36 percent in 1983 to 32 percent in 1987.

GOAL: DEVELOP A CENTRALIZED STATEWIDE TELECOMMUNICATIONS SYSTEM TO PROVIDE ACCESS IN REGIONS THROUGHOUT THE STATE TO THE HIGHEST CALIBER OF INSTRUCTIONAL RESOURCES AND COMPUTATION FACILITIES AVAILABLE IN HIGHER EDUCATION IN TEXAS.

Due to its vast size and widely dispersed population, Texas poses unique challenges in providing uniform access to educational opportunities in regions throughout the state. In 1987, the Texas Legislature recognized that a statewide telecommunications network among higher education institutions could effectively address the access problem. In HB 2181 the Legislature mandated that the Coordinating Board develop such a network for integrated teaching and data transmission and for computation. Under the system, the resources, for example, of several outstanding Texas engineering schools could be shared among institutions and made available in areas where engineering education has never been offered. The project would not only expand education via instructional telecommunications, but would also make possible an investigation of the effectiveness and relative costs of telecommunications-based instruction versus conventional means.

PRINCIPLE -- QUALITY: THE PEOPLE OF TEXAS EXPECT QUALITY IN ALL ASPECTS OF PUBLIC HIGHER EDUCATION: TEACHING, RESEARCH AND PUBLIC SERVICE.

"Teaching is the central mission of higher education. To that end, our faculties should be among the best in the United States, and their compensation should be competitive with those of comparable institutions throughout the nation. Outstanding faculties should be developed, recruited, and retained by our institutions, rewarded for excellence, and provided sufficient resources to perform their academic functions.

Research is an integral component of Texas higher education, enhancing both the educational process and the advancement of knowledge. University research contributes to economic growth through the education and training of scholars and scientists and through

the discovery of new insights and relationships leading to innovation and new technology. The quality of university research should be improved by increasing the access to research funds among all campuses and academic disciplines, by encouraging competition through expert review, and by requiring greater accountability through merit evaluation of state-supported research programs.

Public service is a significant function of higher education. Colleges and universities enrich the State's quality of life by providing public access to libraries and cultural events. Local communities are afforded direct assistance from the agricultural and engineering extension services and academic health care centers. Most importantly, institutions of higher education shall serve both the private and public sectors as an independent source of information for policy decisions, resource allocations, management options and regulatory issues.

Effective teaching, research and public service can be achieved only in an environment free of censorship and restrictions. The autonomy and integrity of our institutions of higher education should always be assured."

Principle I, *Texas Charter for Public Higher Education*

Three component areas of teaching are proposed as having highest priority for improvement. The first concerns all actions necessary to ensure that outstanding faculties are available. The second recognizes that a strong, uniform core curriculum, supported by high quality undergraduate programs, must be adopted and assessed on a regular basis. Finally, the progress of students should be closely followed during their freshman year of college and feedback be provided to their parent high school.

GOAL: DEVELOP, RECRUIT, RETAIN, AND REWARD OUTSTANDING FACULTIES.

If teaching is the central mission of higher education, then a strong faculty is the capstone. Outstanding faculties must not only be recruited, but they must also be given the opportunity to develop and be provided with the support necessary to ensure their retention.

GOAL: ADOPT A UNIFORM CORE CURRICULUM AND REGULARLY ASSESS THE QUALITY OF UNDERGRADUATE PROGRAMS.

Undergraduate education should help students in later life adapt to the changes they will face in economic and social conditions and meet the challenges of an increasingly multicultural society. Their education should provide them with a global perspective and help them develop critical thinking skills, creativity, and intellectual flexibility. A strong core curriculum is the key to such preparation.

GOAL: PROVIDE SYSTEMATIC FEEDBACK TO HIGH SCHOOLS ON THE PERFORMANCE OF THEIR GRADUATES DURING THE FRESHMAN YEAR OF COLLEGE.

Recent studies in a number of states, including Texas, indicate that a substantial proportion of high school graduates are underprepared to function adequately at the college and university level. A statewide Coordinating Board committee studying this problem estimated in 1986 that at least 30 percent of Texas students entering their freshman year in college are deficient in the basic skills of reading, writing, or mathematics.

GOAL: IMPROVE THE ACADEMIC PREPARATION OF TEACHERS.

By stressing the importance of preparing qualified teachers for grades kindergarten through 12, colleges can help ensure the success of their future students.

GOAL: IMPROVE THE QUALITY OF UNIVERSITY RESEARCH BY INCREASING THE ACCESS OF ALL CAMPUSES TO RESEARCH FUNDS AND ACADEMIC DISCIPLINES, BY ENCOURAGING COMPETITION THROUGH EXPERT REVIEW, AND BY REQUIRING GREATER ACCOUNTABILITY THROUGH MERIT EVALUATION OF STATE-SUPPORTED RESEARCH PROGRAMS.

Universities have two primary roles in society: creating new knowledge (research), and passing knowledge on to succeeding generations (teaching). In recent years, research has assumed increasing importance for two reasons.

First, the relationship between research and teaching is better understood. While at one time it was believed that teaching and research were competing activities, it is now abundantly clear that in order to be a good teacher, a professor must be a part of the creative enterprise. It is necessary to give students proper guidance, to set high standards of scholarship, and to generate enthusiasm for the subject. The most practical means for a professor to stay current in the discipline is to actively participate in research.

Second, the link between research and economic development is becoming increasingly clear. The Texas economy during the 21st Century, like that of the United States, will be based in large part on new technologies, many of which are not yet discovered. If our children and grandchildren are to fully benefit from this transformed economy, it is important that Texas colleges and universities be prepared to educate

succeeding generations to create and use new technologies. This will only happen if our colleges and universities are themselves conducting leading-edge research.

GOAL: SERVE AS AN INDEPENDENT SOURCE OF INFORMATION FOR PUBLIC POLICY AND MANAGEMENT ISSUES AND PROVIDE OTHER COMMUNITY AND PUBLIC SERVICES.

Public service includes the provision of institutional facilities, such as libraries and museums, as well as the provision -- outside the school's regular programs of teaching and research -- of faculty, staff, and student expertise. It also includes the provision of direct patient care, health care support services, research, community services, and agricultural extension services. The training and retraining of adult workers for industry and other types of flexible, short-term continuing education programs are also emerging as public service responsibilities of colleges and universities. Postsecondary institutions are assuming a larger role in providing the technical and vocational education that industry needs to keep pace with change.

PRINCIPLE -- DIVERSITY: HIGHER EDUCATION SHOULD PROVIDE A DIVERSITY OF QUALITY EDUCATIONAL OPPORTUNITIES.

"The state is best served through diverse academic and cultural campus environments. Each postsecondary educational institution should be assigned a distinct role. Each college and university should strive to excel in selected academic or technical areas and to achieve distinction among peers nationwide. Independent colleges and universities constitute a vital segment of the diverse educational opportunities in the state. In recognition of their important role, the state, through appropriate public policies, should encourage their continued vitality and contributions as integral parts of the higher education system in Texas."
Principle III, *Texas Charter for Public Higher Education*

GOAL: ASSIGN TO EACH INSTITUTION A DISTINCT ROLE AND SCOPE.

The identification of a role and scope, or mission, for individual institutions ensures that a broad range of educational opportunities are available to serve the variety of needs of the state's citizens. Defined missions thus promote access and diversity. They also enhance quality by providing priorities for institutional development, as well as criteria for evaluating performance. And missions promote efficient use of resources by making institutional roles complementary rather than duplicative.

GOAL: ENSURE EXCELLENCE IN SELECTED ACADEMIC AND/OR TECHNICAL AREAS AT EACH INSTITUTION.

Every Texas institution of higher education plays an important role in addressing state educational needs. Vocational and technical training, baccalaureate education, and graduate and professional education are all significant. Quality is equally important as diversity. Each institution should have the opportunity to excel in selected program areas.

GOAL: ENCOURAGE THE VITALITY AND CONTRIBUTIONS OF INDEPENDENT COLLEGES.

Independent colleges and universities are an integral part of the pluralistic higher education system that serves Texas. With their unique histories, traditions, and missions, as well as their personalized educational approach and specialized curricula, independent colleges offer a variety of opportunities not available within the public system. And although these institutions are privately endowed, created, operated, and financed, it could be said that by providing their services to the citizens of Texas, they are providing a "public subsidy." A strong independent sector of higher education promotes excellence by fostering healthy competition with state colleges. At the same time, collaborative action can provide programs and services not otherwise possible.

PRINCIPLE -- ADEQUATE FUNDING: SUPPORT THROUGH ADEQUATE FUNDING IS CRITICAL IF HIGHER EDUCATION IS TO ACHIEVE ITS PURPOSE.

"Definitions of role and scope should identify the specific purposes of each Texas college and university as well as those activities eligible for state support. Base funding should be allocated at levels which will enable each institution to achieve its primary objectives. Special incentive and initiative funding should enable individual institutions to develop distinct strengths. Colleges and universities should be encouraged to expand use of local, federal, corporate and philanthropic funds to further their specific goals."
Principle IV, *Texas Charter for Public Higher Education*

GOAL: ADOPT AND RECOMMEND FORMULAS TO THE GOVERNOR AND LEGISLATURE FOR THE NEXT BIENNIUM.

Legislative appropriations for senior universities, community colleges, and technical institutes are allocated by formula. The two medical schools and five health science centers negotiate directly with the Legislature for appropriations.

GOAL: RECOMMEND TO THE LEGISLATURE FUNDING FOR SPECIAL AREAS FOR INCENTIVE AND INITIATIVE GRANTS TO BE ALLOCATED BY THE COORDINATING BOARD TO INSTITUTIONS OF HIGHER EDUCATION.

Chapter 61.051, Texas Education Code, directs the Coordinating Board to request funding for incentive and initiative grants for public universities, medical schools, health science centers, and the Texas State Technical Institute.

GOAL: MAXIMIZE THE USE OF LOCAL FUNDS TO INCLUDE FEDERAL, CORPORATE, AND PHILANTHROPIC FUNDS.

An essential part of the support for higher education is from sources of income other than state appropriations. These funds include student tuition and fee charges, indirect cost recovery, gifts, funds earned from endowment investments, sale of services, and other sources.

PRINCIPLE -- EFFECTIVE MANAGEMENT: THE PEOPLE OF TEXAS ARE ENTITLED TO EFFICIENT AND EFFECTIVE MANAGEMENT OF HIGHER EDUCATION.

"Colleges and universities should strive to reduce operating costs through the improved management of human resources and through the cost effective management of physical plants and equipment. Financial reporting information shall be standardized and simplified to allow for statewide review and planning. Financial incentives for managerial effectiveness should be provided to all colleges and universities demonstrating measurable operating efficiencies and increased productivity."
Principle V, *Texas Charter for Public Higher Education*

GOAL: STRIVE TO REDUCE OPERATING COSTS THROUGH THE IMPROVED MANAGEMENT OF HUMAN RESOURCES.

Human resource management systems should include controlled personnel procedures, scheduled work evaluations, methodologies for work analyses, systematic salary plans, adequate training and development programs, and procedures for maintaining complete employee records.

GOAL: REDUCE OPERATING AND MAINTENANCE COSTS THROUGH MORE EFFICIENT AND EFFECTIVE MANAGEMENT OF PHYSICAL PLANTS.

The original cost of a building is only a small percentage of the life cycle cost of the structure. An accurate facilities inventory for assessing space utilization and energy consumption and for scheduling repairs and rehabilitation is an essential tool in assisting the institutions in reducing operating costs. Tasks designated for the achievement of this goal include the adoption of policies and practices to reduce utility costs; discontinuance of practice of deferred building maintenance; development review and revision of campus master plans; and the concurrent development of required guidelines relative to space utilization and appropriate use of Higher Education Assistance Fund Appropriations.

GOAL: DEVELOP AND IMPLEMENT A UNIFORM FINANCIAL REPORTING SYSTEM FOR ALL PUBLIC INSTITUTIONS OF HIGHER EDUCATION.

Approximately 30 percent of all reports submitted by public institutions of higher education pertain to financial information. This information is not centrally maintained and is found on file with the State Auditor, State Comptroller, Legislative Budget Board, State Treasury, the State Purchasing and General Services Commission, and the Governor's Office.

PRINCIPLE -- LEADERSHIP: THE PEOPLE OF TEXAS ARE ENTITLED TO CAPABLE AND CREATIVE LEADERSHIP IN HIGHER EDUCATION.

"The Texas Legislature shall define state policies and goals for higher education, appropriate the necessary funds to achieve those ends, and hold the higher education system accountable.

The Texas Higher Education Coordinating Board shall serve as an advocate for higher education, providing advice and comprehensive planning capability to the Legislature, coordinating the effective delivery of services, and efficiently administering assigned statewide programs.

Regents and administrators of systems and institutions of higher education shall ensure efficiency in program planning and management, excellence in program performance, and accessibility to all Texas residents who seek and qualify for admission to postsecondary education and training.

Faculty in Texas public higher education shall develop the intellectual potential of their students through superior teaching, create new knowledge through superior scholarship and research, and generally improve the economic and social condition through training in vocation and professions."
Principle VI, *Texas Charter for Public Higher Education*

While effective leadership is, itself, one of the principles adopted to guide Texas Higher Education it is also the catalyst for accomplishment of the goals associated with each of the other five principles of higher education. The continued success of Texas higher education requires the collaboration and cooperation of all in the higher education community in working towards the common goal of excellence in higher education.This conclusion and the statistical data in this section are based on publications by the following sources: Baylor University Forecasting Service; The Strategic Economic Policy Commission; Economic Analysis Center, Texas Comptroller of Public Accounts; and Bureau of Business Research, The University of Texas at Austin.

Appendix A

Planning Schedule for Development of the Five-Year Master Plan for Higher Education in Texas

Central to the development of a master plan for higher education is the appointment of an advisory committee to work closely with the Coordinating Board staff. The proposed concept for the plan development is that the advisory committee and the staff will complete an update to this document for presentation to the Texas Legislature in January 1990 and forward the complete master plan to the Legislature in January 1991. The proposed schedule of major events follows:

1989

January	Master Plan Advisory Committee appointed by the Commissioner of Higher Education
February	First Meeting of the Master Plan Advisory Committee: Overview, review materials, determine process
May	Second meeting of the Master Plan Advisory Committee: Discuss essential elements of the complete Master Plan (1991)
June - July	Staff develops outline for complete Master Plan (1991) and proposed content of Updated Master Plan (1990)
August	Third meeting of the Master Plan Advisory Committee: Review complete Master Plan (1991) outline and discuss Updated Master Plan (1990)
October	Updated Master Plan (1990) submitted to Coordinating Board for consideration
November	Fourth meeting of the Master Plan Advisory Committee: Discuss preliminary draft of complete Master Plan (1991)

1990

January	Updated Master Plan (1990) submitted to Legislature
February	Fifth Meeting of the Master Plan Advisory Committee: Continue work on draft of complete Master Plan (1991)
May	Sixth meeting of the Master Plan Advisory Committee: Finalize draft for complete Master Plan (1991) and send to institutions, appropriate agencies, and Coordinating Board staff for review
July	Report to the Coordinating Board on status of the complete Master Plan (1991) draft
August	Seventh meeting of the Master Plan Advisory Committee: Revise complete Master Plan (1991) based on recommendations and comments
September	Hearing on complete Master Plan (1991)
October	Complete Master Plan (1991) submitted to Coordinating Board for consideration

1991

January	Complete Master Plan (1991) sent to the Legislature

Appendix B

History and Description of Texas Higher Education

Public higher education began in 1876 with the establishment, through a federal land grant, of a college to provide training in agriculture and the mechanic arts -- Texas A&M. Texas's first private college started with great promise near LaGrange in 1840. It soon declined and was succeeded, according to some sources, by Southwestern University at Georgetown.

The early pattern of the Texas public higher education system included a state university, land grant colleges, teachers colleges, and special purpose institutions. By the end of the 19th century, Texas had six public institutions.

Community colleges made their first appearance in the early 20th Century as junior colleges, designed to offer the first two years of traditional college study. World War II and the national defense effort, as well as an increasingly industrialized, technical society, brought demands for greater educational opportunities in Texas. As a result, junior colleges broadened their curricula, and the comprehensive community college of today began to emerge. The number of public senior institutions gradually increased, reaching a total of 23 by the mid-1960s.

In 1965, after a governor's committee had recommended that the state's higher education system be moved to top priority for planning, funding, expansion, and enhancement of quality, the Legislature established the Coordinating Board. The state's population was growing rapidly. In the decade following the creation of the Coordinating Board, it increased by more than 57 percent, and the Board recommended the establishment of new college campuses. Within 10 years, the number of senior colleges and universities expanded from 23 to 37. Texas responded equally as fast to a national -- and state -- crisis in the shortage of physicians. In 1968, Texas had two public and one private medical school. By 1977, just nine years later, it had established five more. During the same period, a variety of other centers, schools, institutes, and programs sprang up in nursing, allied health, the biomedical sciences, and other specialties. A new dental school was also opened, bringing the total to three. In addition to these institutions, Texas has 49 community college districts and separate governing boards with 67 campuses as well as four campuses of the Texas State Technical Institute.

Enrollment in all Texas Higher Education institutions increased significantly during the 1970s, for an annual average gain of 5.66 percent. The gain in the 1980s has averaged 3.15 percent annually. Losses in total enrollment occurred in 1984 and 1985, followed by gains of approximately two percent in 1986 and 1987. However, in the fall of 1988, enrollment increased by more than 5.8 percent.

During the period from 1970 to 1979 public university enrollment grew each year for a total increase of 92,671 students; an average annual increase of 4.32 percent. These annual increases continued through 1984; then in 1985 and 1986 the public universities experienced the first enrollment losses. There was a slight recovery in 1987 (1.82 percent increase) and a very large enrollment increase (5.32 percent) in 1988.

The average annual public university enrollment gain for the period 1980 to 1988 has been 1.7 percent. Community college enrollment has followed the same general trend but at a higher rate of increase. Enrollment increased steadily through 1983, with enrollment losses in 1984 and 1985. During the period 1970 to 1979 there was a total increase of 117,009 students for an average annual increase in community college enrollment of 10.47 percent. Substantial increases also occurred in 1986, 1987 and 1988. The average annual community college enrollment gain for the period 1980-1988 has been 4.75 percent.

Enrollment for the public health-related institutions grew dramatically in the 1970s, increasing by more than 300 percent. Growth for these institutions has been slower (3.75 percent annually) during the 1980s, but still higher than that of the general academic institutions. The independent institutions' enrollment grew by an average annual rate of 1.21 percent in the 1970s and by less than one percent during the 1980s.

Following are descriptions of each of the components in the Texas higher education system:

1. Public Universities and Centers: There are 37 public general academic institutions: 33 offer both baccalaureate and graduate level degrees; one offers undergraduate degrees only; one has a special purpose (marine-related four-year programs); and two are lower-division centers. Doctoral degrees are offered at 14 institutions, although six of these have only a single doctoral program in a specialized field.

As a whole, these institutions offer programs in a wide variety of fields including biological sciences, business and management, communications, computer and information sciences, education, engineering,

fine and applied arts, foreign languages, health professions, home economics, law, literature, library science, mathematics, physical sciences, psychology, public affairs, social sciences, and other studies.

The enrollments of these institutions vary from approximately 400 students at the smallest center to more than 47,000 at the largest university. Growth during the five-year period from 1977-1982 averaged about 2 percent annually, but slowed to less than 1 percent during the past five years. This lower rate is expected to continue through 1993.

2. Public Medical Schools and Health Science Centers: Texas has one private and seven public medical schools, (one of which offers degrees in osteopathic medicine). There are one private and two public dental schools. There are four graduate schools of biomedical sciences, five allied health schools, and four nursing schools. In addition, there is one College of Veterinary Medicine. Allied health and nursing programs are offered throughout the college and university system in addition to those at the medical schools and health science centers.

The fall 1987 enrollment for all public health science centers, medical and dental institutions was 10,878. From 1977 to 1982, enrollment in health-related institutions increased by approximately 2,300 for an average annual growth of 5.4 percent. However, for the last five years, average annual growth has been less than 1 percent.

Public medical schools and health science centers receive appropriations from the Texas Legislature based on funding requests and justifications submitted by the institutions. Although these units have not been a part of the formula system in the past, new formulas are currently being developed to include funding for those allied health and nursing programs located in the five health science centers.

3. Public Community Colleges and Texas State Technical Institute: There are 49 public community districts with 67 campuses. These institutions provide the following programs: technical and vocational programs up to two years in length leading to associate degrees or certificates; vocational programs relating to semi-skilled and skilled occupations; freshman and sophomore courses in the arts and sciences; continuing adult education; and compensatory education and counseling. The four campuses of the Texas State Technical Institute offer technical and vocational programs only.

Enrollments in the public community college districts range from 720 to a high of more than 48,000. There are five large districts, each with approximately 20,000 or more students, located in the major metropolitan areas. The statewide enrollment at all public community colleges was 318,563 in fall 1987. Over the past 10 years, enrollment increased by more than 95,600 students for an average annual growth of 6 percent. Most of this growth was during the five-year period from 1977 to 1982; during the last five years, growth in the public community colleges has been slower, averaging about 1 percent annually. This lower rate is expected to continue for the next five years.

The Texas State Technical Institute had an enrollment of 8,830 in fall 1987. During the last five years, enrollment at this institution has remained relatively stable with a high of about 9,000 and a low of about 8,600. During the next five years, enrollment at the technical institute is expected to increase by slightly more than 1 percent annually.

The community colleges are financed by local ad valorem tax revenues raised within the respective districts, by tuition and fees, by other local funds, and by state appropriated general revenue funds. (The Texas State Technical Institute (TSTI) does not receive local ad valorem tax revenues.) General revenue funds appropriated to public community colleges for the 1988-89 biennium totaled $827 million.

4. Independent Colleges and Universities: There are 37 senior, general academic, independent institutions in Texas. All offer four-year programs leading to a bachelor's degree; 20 also offer master's level programs; five have doctoral level programs, and three have special professional (law) programs. These institutions generally offer studies in all areas found at the public universities, with the exception of agricultural extension programs. Many of the independent institutions offer religion and theology programs, which are not found at the public institutions. In addition to the general academic institutions there are three independent junior colleges offering freshman and sophomore academic courses and independent colleges of medicine and dentistry.

Enrollments at individual institutions range from a low of less than 300 students to more than 11,600 for the largest university. Ten of the 37 independent senior institutions have an enrollment greater than 2,000 and 13 have enrollments less than 1,000. Over the last 10 years, enrollment has increased at an average annual rate of slightly more than 1 percent. The fall 1987 enrollment for the senior independent colleges and universities was slightly over 79,000. Enrollment is expected to remain relatively stable over the next five years.

Appendix C
The Texas Population

	Population 1985		Population 1995		Change 1985-1995	
Age	Number	Percent	Number	Percent	Number	Percent
0-14	3,886,108	24.04	4,768,355	24.28	+ 882,227	+ 22.45
15-19	1,293,315	8.00	1,449,069	7.38	+ 155,754	+ 12.04
20-24	1,475,769	9.13	1,457,665	7.42	- 18,104	- 1.23
25-29	1,558,515	9.64	1,482,771	7.55	- 75,744	- 4.86
30-34	1,400,406	8.66	1,658,694	8.45	+ 258,288	+ 18.44
35-39	1,193,451	7.38	1,731,487	8.82	+ 538,036	+ 45.08
40-Up	5,357,992	33.15	7,089,857	36.10	+1,731,865	+ 32.32
Total	16,165,566	100	19,637,898	100	+3,472,332	+ 21.48

Table 2

The population estimates and projections presented in this appendix are based on a combination of the Coordinating Board projection model and the Texas Department of Health's data on ethnic distribution.

Age of the Texas Population: Shown in Table 2 is the age distribution of the Texas population for the years 1985 and 1995.

During the 10-year period from 1985 to 1995 the older age groups in Texas will increase at a much faster rate than the population as a whole. The result is an aging of the population. While in 1985, persons between the ages of 15 and 34 years comprised more than 36 percent of the population, in 1995 the ratio of persons in this age bracket will be about 31 percent.

Ethnic mix of the Texas Population: Shown in Figure 4 is a comparison of the ethnic mix of the total Texas population for 1985 and 1995.

Within the 15-34 year-old age group, the Anglo and "other" population will decline during the 10-year period from 1985 to 1995, and the black population will increase modestly. At the same time, the Hispanic population in this age group will increase at a rate more than four times greater than the population as a whole. By 1995 Hispanics will account for 28 percent of the 15-34 year-old age group, up from 23 percent in 1985.

The Hispanic population mix is even more significant in some regions of the state, such as South Texas as shown in Table 3.

Hispanic Population of South Texas						
Counties	Hispanics as Percent of Total Population		South Texas Total Population as Percent of State Total		South Texas Hispanic Population as Percent of State Hispanic Population	
	1985	1995	1985	1995	1985	1995
24 South Texas Counties	66.37%	70.84%	8.80%	9.45%	26.67%	26.18%
24 South Texas Counties and Bexar	57.19%	61.90%	15.61%	16.17%	40.79%	39.15%
All Texas Counties	21.89%	25.56%	---	---	---	---

Table 3

TEXAS POPULATION BY ETHNICITY, ALL AGES

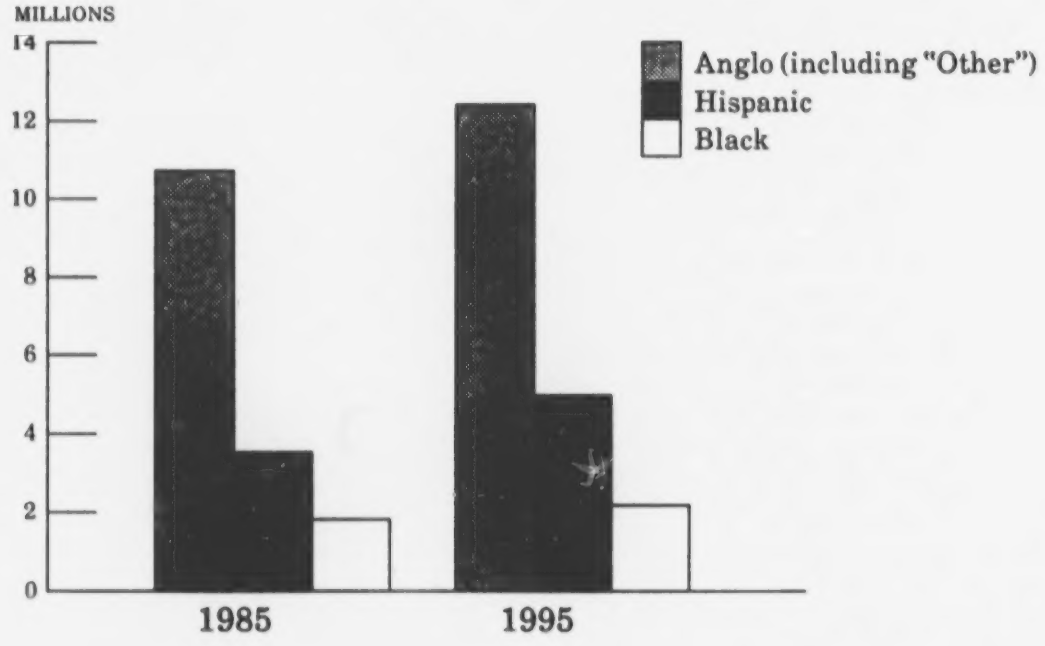

Figure 4

TEXAS POPULATION BY ETHNICITY, AGES 15-34

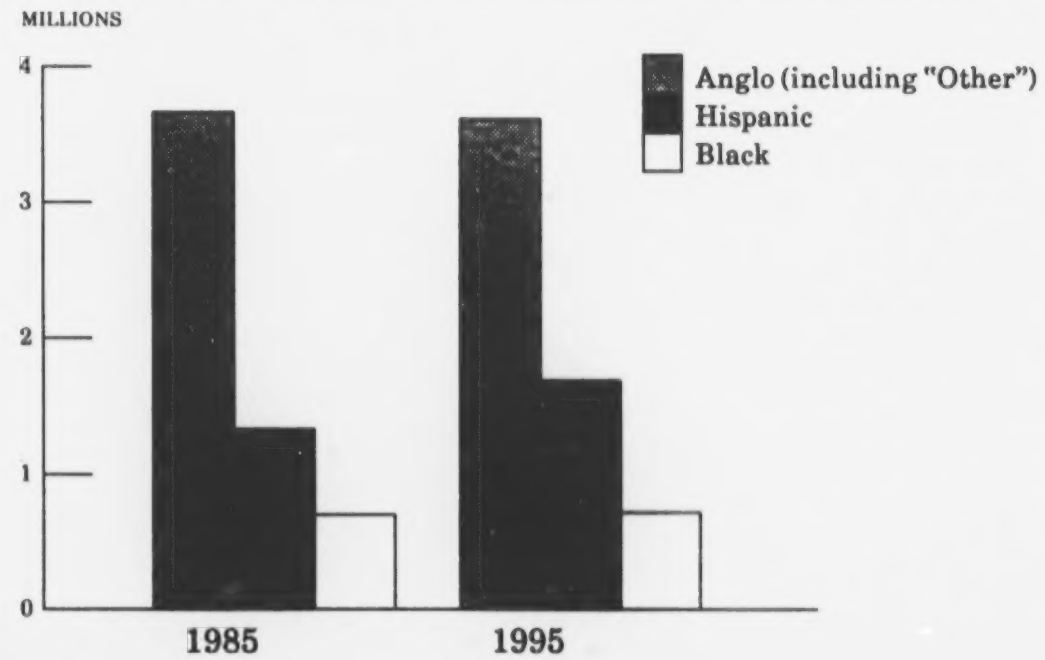

Figure 5

Appendix D

Annual Status Report: Fiscal Year 1988

This status report presents activities and accomplishments in Texas higher education for the 1988 fiscal year (September 1, 1987 - August 31, 1988). It is organized around the same six principles as stated in the *Texas Charter for Public Higher Education* (1987). This report replaces the annual report that the Coordinating Board previously produced as a separate publication.

1. Access to Higher Education

a) Educational Opportunity Planning. The Coordinating Board created a new Educational Opportunity Planning Division to emphasize the state's continuing efforts to improve minority access to higher education. Among the division's activities are the following:

- Educational Opportunity Plan. With the assistance of representatives from the state's colleges and universities, the division at the request of the Governor began the development of a five-year educational opportunity plan to replace the federal plan that expired in 1988. (See part 6, "Leadership," of this report for details.)
- Youth Opportunities Unlimited. Eighteen college and technical institute campuses participated in 1988 in the Y.O.U. program, which provides at-risk high school students with direct exposure to college. Transferred to the Coordinating Board in January 1987, Y.O.U. uses federal Job Training Partnership Act funds to support the placement of economically disadvantaged students on campuses of higher education. During the eight-week summer term, students work part-time in paid jobs and attend classes for high school credit. In fiscal year 1988, 1,851 students participated in the program.
- Community College Transfer Project. A pilot project was initiated in 1988 to encourage minority students attending community colleges to transfer to senior institutions. The new program involves three institutions, Blinn College, Sam Houston State University, and Texas A&M. Called BEST, Blinn College Student Ethnic Transfer Project, the program is an outgrowth of the expired Texas Equal Educational Opportunity Plan for Higher Education.
- Recruitment and Retention Conference. To inform the Texas higher education community of recruitment and retention efforts and issues, the Coordinating Board held the fourth annual Minority Student Recruitment and Retention Conference in April of 1988. Speakers from the American Council on Education and from higher education institutions discussed strategies and trends in presentations to more than 250 participants from 82 public institutions.

b) College Bound. The Texas Higher Education Coordinating Board initiated College Bound in 1988 to encourage at-risk minority students to complete high school and consider college. Eighth grade students in targeted minority school districts are invited to register for the five-year program which offers assistance with college financial aid applications, a semiannual newsletter with tips for success in high school and career information, and personal replies to student correspondence. In its first year, approximately 50,000 students in more than 200 districts registered for College Bound.

c) Financial Aid. The Coordinating Board's Division of Student Services continued to increase access to higher education for thousands of students in 1988 through its ongoing grant and loan programs and through the development of a new loan program.

- Grants. The Coordinating Board administered nine grant programs providing Texas students with 30,565 awards, totalling $25,300,256. The number of awards represented an 11.3 percent increase over the number awarded in 1987. The amount awarded represented an 8.8 percent increase over the $23,253,005 awarded in 1987.
- Loans. Many more students turned to the state for loans in 1988 than in the previous year, partly because new, more restrictive federal guidelines in the Guaranteed Student Loan Program resulted in fewer commercial lenders than before. Students were also attracted to the state's lower interest rates and a simpler repayment system. (Unlike commercial loans, which frequently involve several secondary markets and/or collection agencies, a state loan is serviced throughout its history by the Coordinating Board.) The number of student loans awarded in 1988 was 7,314, a 73 percent increase over 1987. The amount loaned was $25,368,808, an 85 percent increase over the $13,693,033 loaned in 1987.

The Coordinating Board implemented a new

loan program in 1988. Called the Hinson-Hazlewood College Access Loan, it is designed for students who do not qualify for federal loans but need financial assistance to attend college. The first loan under this program was issued in June 1988, and by August 31, more than 900 students had received over $3 million through the program.

A loan repayment program that recruits (or retains) physicians for service in state agencies or in economically depressed and rural, medically underserved areas of the state assisted 12 physicians in 1988. In exchange for their service to the state, the Physician Student Loan Repayment Program paid $52,375 towards the retirement of their medical education loans.

2. Quality in Higher Education

a) Faculty Salaries. Salaries for faculty at Texas colleges and universities improved during 1988, climbing 10.5 percent to average $37,091 for the ranks of professor through instructor. The compensation for these faculty moved closer to the national average of $38,669. However, Texas remains 10.8 percent short of its goal to reach the average salary of $41,568 in the 10 most populous states.

b) EESA Grants. The Coordinating Board awarded $7.2 million in competitive grants to strengthen the skills of teachers and improve the quality of instruction in mathematics, science, and foreign language. Funded through the federal Education for Economic Security Act (EESA Title II), 25 institutions received support for 38 projects under this program in 1988.

c) Degree Programs. Texas institutions of higher education and the Coordinating Board took steps to ensure that the quality of degree programs is maintained. The following policy issues were among those decided in 1988:

- To help preserve the integrity of existing degree programs, the Coordinating Board in 1988 revised its policy on the approval of new programs. According to the new policy, Coordinating Board approval is contingent upon the institution's certification that it can provide at least 50 percent of the funding needed, without drawing on resources for existing programs, for the first five years of the new program's operation.

Institutions with teacher education programs worked in 1988 to reorganize and streamline those programs in accordance with the teacher education legislation passed by the 70th Legislature. The legislation called for the elimination of education as a major. Prospective teachers will instead have to earn a degree in an academic major. The Coordinating Board adopted policy guidelines to assist the institutions in complying with the legislation.

- The Coordinating Board reaffirmed the importance of requiring students to take at least one-third of their courses on the institution's campus when it rejected a proposal to establish the state's first graduate degree program taught entirely off campus.

d) Texas Academic Skills Program. The TASP will test the basic skills of entering college freshmen beginning in the fall of 1989. Legislation creating the TASP specifies that students must pass the test before they can take upper division courses, the completion of which would give the student 60 or more semester credit hours. Representatives of Texas' academic and minority communities assisted the Coordinating Board during the year in developing rules regarding eligibility, program administration, advisement, remediation, and reporting procedures.

e) Research. The Coordinating Board established a new research division to handle the following research activities in 1988:

- The Advanced Research Program and the Advanced Technology Program, created by the 70th Legislature, attracted more than 3,000 grant proposals for basic and applied research in science and engineering. The Advanced Technology Program distributed $40 million to researchers in applied fields that offer promise of near-term commercialization. The Advanced Research Program awarded $20 million to projects concerned with basic research. The goal of these programs is to stimulate ongoing scientific research and technological development that will help improve the state's economy.
- Through the Research Enhancement Program, public universities in Texas received an additional $13 million to support faculty research. The formula-derived funding enables each university to support faculty projects chosen on the basis of campus-wide peer review procedures.
- The Research Assessment Program was established by the 70th Legislature to evaluate research projects that are funded by special item appropriations. Working with out-of-state consultants, the Coordinating Board staff has begun reviewing 44 research projects which

annually receive approximately $23 million in general revenue funding.

- The Energy Research in Applications Program (ERAP) was established by the 70th Texas Legislature as a $15 million competitive contract research program based on a peer review selection process. Top proposals were selected for funding from 323 individual investigator and 15 consortia proposals which were submitted by university based scientists and engineers in five topical areas related to energy savings.
- The Coordinating Board facilitated the development of intellectual property policies for all public and many private institutions of higher education in Texas. These policy statements are designed to clarify the ownership and encourage the commercialization of university-developed research results.
- A Texas Research Seminar was sponsored by the Coordinating Board in 1988. Designed as part of a strategy to increase federal research funding to Texas colleges and universities, the seminar attempted to identify research strengths within Texas and foster cooperative agreements among research institutions.

As evidence of the growing stature in 1988 of Texas university research programs, two national research centers were funded in the state. Texas A&M University and the University of Texas at Austin will house an engineering research center, funded by the National Science Foundation, to research offshore drilling and recovery technology. Also, Texas A&M, in conjunction with Texas Southern University and the University of Texas at Austin, will house one of 10 national research centers related to transportation and highway technologies. A consortium of 14 Texas institutions was established to test Phase II of the Federal Demonstration Project, a program which transfers many research administrative functions from federal program managers to university research administrators.

3. Diversified Educational Opportunity

a) New Degree Programs. In 1988, the Coordinating Board approved 33 new associate of applied science degree programs and 17 new baccalaureate and master's degree programs. These include approval of a bachelor of science with a major in genetics at Texas A&M University, a bachelor of arts with a major in philosophy at Pan American University, both bachelor of arts and bachelor of science degrees in English, mathematics, and history at East Texas State University at Texarkana, and a master of arts degree with a major in international studies at Angelo State University. In addition, a review of Texas' graduate nursing programs during 1988 resulted in the creation of two new master of science in nursing programs, one at Texas Tech Health Sciences Center and the other at the University of Texas at Tyler. External consultants found the quality of the Texas programs to be sound and studied the potentiality of several other institutions for supporting doctoral programs in nursing.

b) Adult Vocational Guidelines and Common Course Manual. This manual, approved by the Coordinating Board in December 1987, provides the framework for sunsetting courses from the state inventory. More than 5,000 courses have been deleted this year, freeing up state funds to support more intensive training that business and students could not otherwise afford.

c) Family Practice Residency Programs. The Coordinating Board provides state funds to help support the training of family practitioners to work in medically underserved areas of Texas. While the level of funding, at $7,295,000, has remained the same for the last several fiscal years, the number of residents trained increased from 442 in FY 1986 to 468 in FY 1988. New programs were started in 1988 at Texas College of Osteopathic Medicine and at Scott and White/Texas A&M University, and approval was given to implement a new program in Brownsville. Other progress during the year includes implementation of a computerized service by the Texas Academy of Family Physicians to match family physicians with practice opportunities. The Coordinating Board provided start-up funds for the program.

d) Resident Physician Compensation. The Coordinating Board administers trusteed funds to support stipends for residents at the primary teaching hospitals of seven of the state's eight medical schools (UTMB-Galveston is not included in this program). In fiscal years 1988 and 1989, the funding for this program was $3,151,875 per year, up from $3 million in the previous two bienniums. This funding was sufficient to support 210,125 residents at the authorized level of $15,000 per resident. A total of 1,719 residents were eligible for funding under the program. Funds are allocated to each medical school on a prorated basis depending upon the number of eligible residents at each school.

e) **Sunset Review.** The sunset review of doctoral programs at Texas universities began in 1988. Seven programs at three institutions were phased out because of low productivity. Final Board consideration of the programs recommended for reapproval following the first cycle of doctoral programs was delayed pending further analysis of need, duplication, and geographical distribution of the programs.

f) **Role and Scope (mission) Statements.** By July 1988, the Coordinating Board approved mission statements for 37 of 45 general academic and health-related institutions. Mission statements were approved during the year for Angelo State University, Pan American University at Edinburg, Prairie View A&M University, Tarleton State University, and West Texas State University.

4. Funding

a) **Institutional Funding.** Changes in the method of funding higher education went into effect in fiscal year 1988. Instead of appropriating an "all funds" amount, including tuition and fees, general revenue and other sources of income, state lawmakers made only a general revenue appropriation to each institution. Public senior colleges and universities received a total of $940,909,460 in general revenue appropriations for FY 1988. Table 4 compares general revenue legislative appropriations for the 1988-89 biennium with those for the 1986-87 biennium.

b) **Agency Budget.** The Coordinating Board's 1988 budget of $586.4 million included $9.3 million for operations, $133 million for trusteed funds, $414.8 million for junior college state aid and $29 million for other grant programs.

5. Efficient and Effective Management

a) **Management Efficiency in Higher Education.** The Coordinating Board, the Council of Governing Boards, and the Texas Association of State College and University Business Officers have undertaken a cooperative project to address the improvements in management efficiency recommended in the study commissioned by the Select Committee on Higher Education.

All Agencies Of Higher Education

	Appropriated		Increase 1988-89 Over 1986-87	
	1986-87 Biennium[1]	1988-89 Biennium[5]	Amount	Percent
Public Senior Colleges	$1,718,648,829	$1,940,877,021	$222,228,192	12.9%
Public Junior Colleges[2]	849,668,320	827,167,562	(22,500,758)	(2.6)
Health Related Units[3]	1,140,889,223	1,227,264,343	86,375,120	7.6
All Other Agencies[4]	571,329,491	591,438,292	20,108,801	3.5
GRAND TOTAL	$4,280,535,863	$4,586,747,218	$306,211,355	7.2%

1 Includes appropriations in H.B. 20 for fiscal year 1986 and S.B. 1 for fiscal year 1987. Does not include salary funds provided according to Article V, Section 95 of the appropriations bill for either year.
2 Amounts in appropriations bill.
3 Includes funds trusteed to the Coordinating Board for health related purposes, and the Texas A&M University Medical Education Program (95.07 percent of the line-item amount to Texas A&M University included for fiscal year 1987).
4 Includes Higher Education Fund, and $17,957,953 appropriated in H.B. 5, Third Called Session, 69th Legislature, 1986.
5 Amounts shown reflect a .65 of 1 percent reduction per provisions of Article V, Section 101 in the appropriations bill.

Table 4

b) Campus Planning. The Coordinating Board adopted a policy requiring all institutions to review their campus planning process with the Coordinating Board and to certify that new construction requests have at least as great a priority as requests for the acquisition of additional or more modern equipment. Of 13 requests for new construction projects (requiring state operation and maintenance money), eight were approved totaling $71.9 million.

c) Missions of Community Colleges. An advisory committee to the Coordinating Board is studying means to ensure that public community colleges operate within their legally defined roles and missions.

6. Leadership

a) Demographics Conference. The Coordinating Board sponsored, with the Governor, a conference in 1988 to address predictions about the state's changing demographics. The conference brought together state leaders in business, industry, and education to consider ways to prepare for and respond to the demographic trends. Conference speakers and participants emphasized that the expansion of educational opportunities for minorities will play an essential role in the state's effort to revitalize the economy.

b) Special Committee on Postsecondary Medical, Dental, and Allied Health Education. This committee was formed on the basis of a recommendation of the Select Committee on Higher Education, which advised the 70th Legislature that a special group should be appointed to study the state's complex health education issues. The Legislature then created the Special Committee on Postsecondary Medical, Dental, and Allied Health Education to study such issues as the most effective system of governance, the role and mission of each health related institution, the long-term manpower needs for physicians and other health professionals, and the role of research in health-related institutions. The Special Committee held hearings and worked throughout spring and summer 1988. Its findings will be considered by the Legislature in 1989.

c) Joint Committee on Higher Education in South Texas. The Joint Committee, co-chaired by Sen. Carlos Truan and Rep. Eddie Cavazos, both of Corpus Christi, was appointed by the lieutenant governor and speaker of the house. The committee was charged with studying higher education needs in South Texas and investigating ways to provide additional degree programs and funding to the region's institutions of higher education. During hearings in Austin, Corpus Christi, Kingsville, Laredo, and the Rio Grande Valley, the committee considered testimony and recommendations from higher education officials and community representatives. The University of Texas and Texas A&M University Systems developed proposals for the improvement of educational opportunities in South Texas. Proposals for possible mergers of the two university systems with schools in South Texas were discussed throughout the summer of 1988. The Coordinating Board recommended that the Legislature appropriate $1.8 million, for the 1990-91 biennium, to universities in South Texas to develop new degree programs. In addition, the Coordinating Board staff is working with the South Texas institutions to reach agreement on expanded program offerings. The Joint Committee will make recommendations to the 71st Legislature in 1989.

d) Texas Educational Opportunity Plan for Public Higher Edcuation. At the request of Gov. William Clements, Jr., the Coordinating Board initiated the development of a new educational opportunity plan to replace the federally mandated plan that expired at the fiscal year's end. The new plan is designed to strongly encourage minority participation in higher education and to provide the institutions with incentives for minority recruitment and retention. The Texas plan is one of the state's major initiatives to meet the educational needs of its rapidly expanding minority population. Increasing minority participation in higher education will produce a well educated workforce and help the state build a diversified economy.

e) Regional Planning. The Texas 70th Legislature stressed that vocational and job training resources should be more responsive to regional and local labor market. In response to this, the Texas Higher Education Coordinating Board, Texas Education Agency, and the Texas Department of Commerce initiated a cooperative effort to implement an effective and responsive regional planning process for Texas in accordance with the Master Plan for Vocational Education. Six regional demonstration projects were jointly funded to serve as models for the future statewide implementation. In 1988, the state agencies sponsored a symposium, to share what had been learned through the efforts of the initial projects. The ultimate goal is to increase the efficiency and cost-effectiveness of matching and delivering training with current and future jobs.